

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An image forming method for removing a substance from an image carrier that disfigures an image, wherein the method comprises, contacting an adsorbent with the image carrier, wherein the adsorbent has a molecular structure including voids that have a diameter great enough to pass molecules of said substance deposited on a surface of the image carrier through the adsorbent and wherein the voids may contain water.

Claim 2 (Currently Amended): A device for removing a substance that disfigures an image, said device comprising:

an adsorbent support supporting an adsorbent having a molecular structure including voids that have a diameter great enough to pass molecules of said substance and wherein the voids may contain water, wherein the substance is present on the surface of an image carrier.

Claim 3 (Original): The device as claimed in claim 2, wherein said adsorbent is affixed to said adsorbent support.

Claim 4 (Original): The device as claimed in claim 3, wherein said adsorbent comprises grains releasably carried on said adsorbent support.

Claim 5 (Original): The device as claimed in claim 4, wherein said adsorbent support includes an elastic body carrying said adsorbent.

Claim 6 (Original): The device as claimed in claim 5, wherein said adsorbent support is rotatable.

Claim 7 (Previously Presented): The device as claimed in claim 6, wherein said the voids of said adsorbent have a diameter great enough to pass molecules of ammonium nitrate.

Claim 8 (Original): The device as claimed in claim 7, wherein said adsorbent comprises zeolite.

Claim 9 (Original): The device as claimed in claim 8, wherein the molecular structure of zeolite has at least six oxygen rings.

Claim 10 (Original): The device as claimed in claim 8, wherein the molecular structure of zeolite has at least eight oxygen rings.

Claim 11 (Previously Presented): The device as claimed in claim 4, wherein said adsorbent support comprises an elastic body and a surface layer removably fitted on said elastic body, said adsorbent being carried on said surface layer.

Claim 12 (Withdrawn): The device as claimed in claim 4, wherein said adsorbent support comprises a brush having bristles on which said adsorbent is carried.

Claim 13 (Withdrawn): The device as claimed in claim 4, wherein said adsorbent support comprises an endless belt passed over a plurality of support members, said adsorbent being carried on a surface of said endless belt.

Claim 14 (Original): The device as claimed in claim 4, wherein said adsorbent support is rotatable.

Claim 15 (Original): The device as claimed in claim 3, wherein said adsorbent support includes an elastic body carrying said adsorbent.

Claim 16 (Previously Presented): The device as claimed in claim 3, wherein said adsorbent support comprises an elastic body and a surface layer removably fitted on said elastic body, said adsorbent being carried on said surface layer.

Claim 17 (Withdrawn): The device as claimed in claim 3, wherein said adsorbent support comprises a brush having bristles on which said adsorbent is carried.

Claim 18 (Withdrawn): The device as claimed in claim 3, wherein said adsorbent support comprises an endless belt passed over a plurality of support members, said adsorbent being carried on a surface of said endless belt.

Claim 19 (Original): The device as claimed in claim 3, wherein said adsorbent support is rotatable.

Claim 20 (Previously Presented): The device as claimed in claim 3, wherein said the voids of said adsorbent have a diameter great enough to pass molecules of ammonium nitrate.

Claim 21 (Original): The device as claimed in claim 20, wherein said adsorbent comprises zeolite.

Claim 22 (Original): The device as claimed in claim 21, wherein the molecular structure of zeolite has at least six oxygen rings.

Claim 23 (Original): The device as claimed in claim 21, wherein the molecular structure of zeolite has at least eight oxygen rings.

Claim 24 (Original): The device as claimed in claim 2, wherein said adsorbent comprises grains releasably carried on said adsorbent support.

Claim 25 (Original): The device as claimed in claim 24, wherein said adsorbent support includes an elastic body carrying said adsorbent.

Claim 26 (Original): The device as claimed in claim 25, wherein said adsorbent support is rotatable.

Claim 27 (Previously Presented): The device as claimed in claim 26, wherein said the voids of said adsorbent have a diameter great enough to pass molecules of ammonium nitrate.

Claim 28 (Original): The device as claimed in claim 27, wherein said adsorbent comprises zeolite.

Claim 29 (Original): The device as claimed in claim 28, wherein the molecular structure of zeolite has at least six oxygen rings.

Claim 30 (Original): The device as claimed in claim 28, wherein the molecular structure of zeolite has at least eight oxygen rings.

Claim 31 (Previously Presented): The device as claimed in claim 24, wherein said adsorbent support comprises an elastic body and a surface layer removably fitted on said elastic body, said adsorbent being carried on said surface layer.

Claim 32 (Withdrawn): The device as claimed in claim 24, wherein said adsorbent support comprises a brush having bristles on which said adsorbent is carried.

Claim 33 (Withdrawn): The device as claimed in claim 24, wherein said adsorbent support comprises an endless belt passed over a plurality of support members, said adsorbent being carried on a surface of said endless belt.

Claim 34 (Original): The device as claimed in claim 24, wherein said adsorbent support is rotatable.

Claim 35 (Original): The device as claimed in claim 2, wherein said adsorbent support includes an elastic body carrying said adsorbent.

Claim 36 (Original): The device as claimed in claim 35, wherein said adsorbent support is rotatable.

Claim 37 (Previously Presented): The device as claimed in claim 36, wherein said the voids of said adsorbent have a diameter great enough to pass molecules of ammonium nitrate.

Claim 38 (Original): The device as claimed in claim 37, wherein said adsorbent comprises zeolite.

Claim 39 (Original): The device as claimed in claim 38, wherein the molecular structure of zeolite has at least six oxygen rings.

Claim 40 (Original): The device as claimed in claim 38, wherein the molecular structure of zeolite has at least eight oxygen rings.

Claim 41 (Previously Presented): The device as claimed in claim 2, wherein said adsorbent support comprises an elastic body and a surface layer removably fitted on said elastic body, said adsorbent being carried on said surface layer.

Claim 42 (Original): The device as claimed in claim 41, wherein said adsorbent support is rotatable.

Claim 43 (Previously Presented): The device as claimed in claim 42, wherein said the voids of said adsorbent have a diameter great enough to pass molecules of ammonium nitrate.

Claim 44 (Original): The device as claimed in claim 43, wherein said adsorbent comprises zeolite.

Claim 45 (Original): The device as claimed in claim 44, wherein the molecular structure of zeolite has at least six oxygen rings.

Claim 46 (Original): The device as claimed in claim 44, wherein the molecular structure of zeolite has at least eight oxygen rings.

Claim 47 (Withdrawn): The device as claimed in claim 2, wherein said adsorbent support comprises a brush having bristles on which said adsorbent is carried.

Claim 48 (Withdrawn): The device as claimed in claim 47, wherein said adsorbent support is rotatable.

Claim 49 (Withdrawn, Previously Presented): The device as claimed in claim 48, wherein said the voids of said adsorbent have a diameter great enough to pass molecules of ammonium nitrate.

Claim 50 (Withdrawn): The device as claimed in claim 49, wherein said adsorbent comprises zeolite.

Claim 51 (Withdrawn): The device as claimed in claim 50, wherein the molecular structure of zeolite has at least six oxygen rings.

Claim 52 (Withdrawn): The device as claimed in claim 50, wherein the molecular structure of zeolite has at least eight oxygen rings.

Claim 53 (Withdrawn): The device as claimed in claim 2, wherein said adsorbent support comprises an endless belt passed over a plurality of support members, said adsorbent being carried on a surface of said endless belt.

Claim 54 (Withdrawn): The device as claimed in claim 53, wherein said adsorbent support is rotatable.

Claim 55 (Withdrawn, Previously Presented): The device as claimed in claim 54, wherein said the voids of said adsorbent have a diameter great enough to pass molecules of ammonium nitrate.

Claim 56 (Withdrawn): The device as claimed in claim 55, wherein said adsorbent comprises zeolite.

Claim 57 (Withdrawn): The device as claimed in claim 56, wherein the molecular structure of zeolite has at least six oxygen rings.

Claim 58 (Withdrawn): The device as claimed in claim 56, wherein the molecular structure of zeolite has at least eight oxygen rings.

Claim 59 (Original): The device as claimed in claim 2, wherein said adsorbent support is rotatable.

Claim 60 (Previously Presented): The device as claimed in claim 59, wherein said the voids of said adsorbent have a diameter great enough to pass molecules of ammonium nitrate.

Claim 61 (Original): The device as claimed in claim 60, wherein said adsorbent comprises zeolite.

Claim 62 (Original): The device as claimed in claim 61, wherein the molecular structure of zeolite has at least six oxygen rings.

Claim 63 (Original): The device as claimed in claim 61, wherein the molecular structure of zeolite has at least eight oxygen rings

Claim 64 (Previously Presented): The device as claimed in claim 2, wherein said the voids of said adsorbent have a diameter great enough to pass molecules of ammonium nitrate.

Claim 65 (Original): The device as claimed in claim 64, wherein said adsorbent comprises zeolite.

Claim 66 (Original): The device as claimed in claim 65, wherein the molecular structure of zeolite has at least six oxygen rings.

Claim 67 (Original): The device as claimed in claim 65, wherein the molecular structure of zeolite has at least eight oxygen rings.

Claim 68 (Original): The device as claimed in claim 2, wherein said adsorbent comprises zeolite.

Claim 69 (Original): The device as claimed in claim 68, wherein the molecular structure of zeolite has at least six oxygen rings.

Claim 70 (Original): The device as claimed in claim 68, wherein the molecular structure of zeolite has at least eight oxygen rings.

Claim 71 (Currently Amended): A process cartridge including a device for removing a substance that disfigures an image, said device comprising:

an adsorbent support supporting an adsorbent having a molecular structure including voids that have a diameter great enough to pass molecules of said substance deposited on a surface of an image carrier, through the adsorbent and wherein the voids may contain water therein.

Claim 72 (Currently Amended): An image forming apparatus comprising:
a device for removing a substance that disfigures an image; and
an image carrier configured to form an image thereon; said device comprising:
an adsorbent support supporting an adsorbent having a molecular structure including voids that have a diameter great enough to pass molecules of said substance through the adsorbent and wherein the voids may contain water, wherein the substance is present on the surface of an image carrier.

Claim 73 (Original): The apparatus as claimed in claim 72, wherein
said adsorbent support is rotatable by being driven by said image carrier.

Claim 74 (Original): The apparatus as claimed in claim 73, wherein said adsorbent support contacts said image carrier at a position downstream, in a direction in which the surface of said image carrier moves, of a position where cleaning means for removing toner left on said image carrier after image transfer contacts said image carrier, but upstream of a position where latent image forming means writes a latent image on said image carrier.

Claim 75 (Original): The apparatus as claimed in claim 74, wherein said adsorbent support contacts said image carrier at a position downstream, in said direction, of a position where a charging device uniformly charges said image carrier, but upstream of the position where said latent image forming means writes a latent image on said image carrier.

Claim 76 (Original): The apparatus as claimed in claim 75, wherein said image carrier comprises an amorphous silicon photoconductor.

Claim 77 (Previously Presented): The apparatus as claimed in claim 75, wherein said image carrier comprises a photoconductor having a surface layer in which a filler is dispersed.

Claim 78 (Previously Presented): The apparatus as claimed in claim 72, wherein said adsorbent support and said image carrier each move at a particular linear velocity.

Claim 79 (Original): The apparatus as claimed in claim 78, wherein said adsorbent support contacts said image carrier at a position downstream, in a direction in which the surface of said image carrier moves, of a position where cleaning means for removing toner

left on said image carrier after image transfer contacts said image carrier, but upstream of a position where latent image forming means writes a latent image on said image carrier.

Claim 80 (Original): The apparatus as claimed in claim 79, wherein said adsorbent support contacts said image carrier at a position downstream, in said direction, of a position where a charging device uniformly charges said image carrier, but upstream of the position where said latent image forming means writes a latent image on said image carrier.

Claim 81 (Original): The apparatus as claimed in claim 80, wherein said image carrier comprises an amorphous silicon photoconductor.

Claim 82 (Previously Presented): The apparatus as claimed in claim 80, wherein said image carrier comprises a photoconductor having a surface layer in which a filler is dispersed.

Claim 83 (Original): The apparatus as claimed in claim 72, wherein said adsorbent support contacts said image carrier at a position downstream, in a direction in which the surface of said image carrier moves, of a position where cleaning means for removing toner left on said image carrier after image transfer contacts said image carrier, but upstream of a position where latent image forming means writes a latent image on said image carrier.

Claim 84 (Original): The apparatus as claimed in claim 83, wherein said adsorbent support contacts said image carrier at a position downstream, in said direction, of a position where a charging device uniformly charges said image carrier, but upstream of the position where said latent image forming means writes a latent image on said image carrier.

Claim 85 (Original): The apparatus as claimed in claim 84, wherein said image carrier comprises an amorphous silicon photoconductor.

Claim 86 (Previously Presented): The apparatus as claimed in claim 84, wherein said image carrier comprises a photoconductor having a surface layer in which a filler is dispersed.

Claim 87 (Currently Amended): The apparatus as claimed in claim 72, wherein said adsorbent support contacts said image carrier at a position downstream, ~~in said direction~~, of a position where a charging device uniformly charges said image carrier, but upstream of the position where a latent image forming means writes a latent image on said image carrier.

Claim 88 (Original): The apparatus as claimed in claim 87, wherein said image carrier comprises an amorphous silicon photoconductor.

Claim 89 (Previously Presented): The apparatus as claimed in claim 87, wherein said image carrier comprises a photoconductor having a surface layer in which a filler is dispersed.

Claim 90 (Previously Presented): The apparatus as claimed in claim 72, wherein said image carrier comprises a photoconductor having a surface layer in which a filler is dispersed.

BASIS FOR THE AMENDMENT

Claims 1-90 are active in the present application. Claims 1-11, 14-16, 19-31, 34-46 and 59-90 are claims which read on the elected specie and are currently under active prosecution. Claims 12, 13, 17, 18, 32, 33 and 47-58 are non-elected claims currently withdrawn from prosecution. Claims 1, 2, 71, 72 and 87 has been amended for clarity. The Abstract has been amended to conform with the requirements of M.P.E.P. § 608.01(b).

The Drawings have been amended for clarity. Figures 1-5, 9, and 13-14 have been amended by changing the original cross-hatching for the elastic material (ref no. 23) of the adsorbent support (ref no. 19).

No new matter is believed to have been added by this amendment.

REQUEST FOR RECONSIDERATION

Applicants thank Examiner Lee for the helpful and courteous discussion of July 2, 2004. Applicants further thank the Examiner for indicating that the subject matter of Claims 4-11, 14-16, 21-31, 35-46, 61-63, 65-70, 73-77, and 79-89 would be allowable if rewritten in independent form and for clarity. During the discussion, Applicants' U.S. representative presented information showing that a molecular structure may have a three-dimensional arrangement of atoms that forms voids within the molecular structure. Applicants' U.S. representative presented arguments that such a structure on a molecular level is different than the structure of, for example, foamed sponges, which may contain voids of, for example, air bubbles dispersed within a matrix material such as rubber.

The Examiner objected to the proposed Drawing changes on grounds including the Drawings lack of a showing of every feature in the invention specified in the claims. Applicants submit herewith proposed Drawing corrections.

The Office objected to Claim 1 with regards to the claim term "adsorbent has ... and contain water". It appears that the Office has interpreted the phrase "and contain water" as limiting of the adsorbent. Applicants submit that the phrase "and contain water" is a description of the voids. Therefore the voids "have a diameter great enough to pass molecules ... and contain water" is a proper reading of the claim. Claims 1, 2, 71, and 72 have been amended for clarity. Applicants submit that those of ordinary skill in the art would understand the claim terminology as it is recited in the present claims.

Applicants therefore respectfully request the withdrawal of the rejection under 35 U.S.C. § 112, second paragraph.

In the Office Action of May 6, 2004, the Office responded to the arguments made in support of patentability in the Amendment and Request for Reconsideration filed on February 9, 2004 by stating "[a]ny sponge or a foam mentioned in the prior art of this Office

Action is made up of molecules, thus reading on the instant invention's 'adsorbent has molecular structure' since the Webster's definition of a molecule is 'the smallest particle of a substance that retains all the properties of the substance and is composed of one or more atoms'. The Office further states that the sponge of the prior art has cells or pores which read on the claimed invention's "voids".

Applicants traverse the rejection on grounds that independent Claim 1 contains a recitation "wherein the adsorbent has a molecular structure including voids". Applicants submit that a molecular structure including voids is not the same as a bulk material which contains cells or voids (such as, for example, a sponge). The adsorbent of the prior art must, of course, contain molecules which have a certain molecular structure. However, the structure of the prior art adsorbent is not disclosed to have a molecular structure that includes voids. In contrast, the presently claimed invention requires the presence of an adsorbent which has "a molecular structure including voids that have a diameter great enough to pass molecules ... and contain water".

It appears that the Office may not be giving full weight to this limitation in the present claims and may be taking notice that a sponge having cells or voids in the bulk material is the same as an adsorbent material that has a molecular structure which includes voids.

In order to demonstrate to the Office that those of ordinary skill in the art readily recognize that a molecular structure that includes voids is different from a macro (e.g. bulk) structure that has cells or voids (e.g., sponge), Applicants attach herewith copies taken from J. E. Huheey, E. A. Keiter, and R. L. Keiter, "Inorganic Chemistry, 4th Edition," Harper Collins College Publishers, (1993), pp. 3-6. The structure of a zeolite material is described beginning on page 3 of the attached pages. A stick diagram of a zeolite is presented in Fig. 1.3 on page 5 where the zeolite structure is described in the caption for the figure as having "channels running in a direction". Such channels are voids that are included in the molecular

structure of the zeolite. In Fig. 1.4 on page 6 of the attached pages a molecule is shown trapped within a void (e.g. channel) of a zeolite material.

This information is provided to show that on a molecular level the bonds between atoms forming the molecule can be arranged to provide a molecular void.

Applicants also attach herewith a dictionary of the term “zeolite” taken from C. A. Hampel and G. G. Hawley, “Glossary of Chemical Terms,” Van Nostrand Reinhold Company, (1976), page 280. In the definition for zeolite it is stated “the crystalline complex forms channels and cages of varying size which are capable of exerting an ionic selectivity or ‘sieving’ effect when placed in salt solutions. Thus, zeolite ion-exchange units are extensively used in water conditioning to remove calcium and magnesium ions by replacing them with sodium ions.” This definition further supports Applicants’ assertion that voids can be present on a molecular level such as in the form of channels defined by the bonding arrangement of atoms which make up a molecule.

Applicants provide further technical descriptions taken from D. N. Lapedes, “Dictionary of Scientific and Technical Terms,” McGraw-Hill Book Company, New York, (1976), pp. 1283 and 1468 providing definitions for the term “rubber”; “rubber sponge”; and “sponge”. The entry for “sponge” refers to only a type of invertebrate animal whereas the entry for the term “sponge rubber” directs the reader to the term “rubber sponge”. The term “rubber sponge” is defined as a foam, flexible rubber produced by beating air into an unvulcanized latex etc. A rubber sponge is therefore produced by taking rubber and introducing voids into the bulk rubber by beating air into it. Therefore in a rubber sponge the cellular structure is derived not on a molecular level but rather on a bulk level where the cells (e.g., voids) in the sponge are created by bubbles of air beaten in to the bulk rubber. The term “rubber” is defined as “a natural, synthetic or modified high polymer with elastic properties”

Applicants provide herewith a description of the molecular structure of rubber taken from K. J. Saunders, "Organic Polymer Chemistry, 2nd Edition," Chapman and Hall, New York (1988), pp. 449-451. As is shown on the attached pages a rubber hydrocarbon is a polymer having a repeat structure. Such a polymer is shown as (IV) on page 450 and is shown to be a linear polymer. A molecular structure that consists of a linear arrangement of atoms bonded to one another cannot form a void.

Applicants submit the information provided above and attached herewith shows that (i) molecules may have a structure that includes voids, (ii) a sponge such as that disclosed in the prior art cited by the Examiner against the present claims (Azuma, JP '081) may be formed by taking a rubber material and beating air into it to provide a cellular structure and (iii) that a rubber material has a structure that does not include voids. Applicants have therefore shown that the adsorbent material of the present claims is different from the sponge of the prior art as shown by the requirement that the claimed adsorbent material includes voids on a molecular level (i.e., a molecular structure including voids) whereas the prior art sponge may include, for example, material that has a molecular structure that is linear and therefore cannot have voids but may be formed into a sponge by including air or cells into a bulk matrix of rubber.

Since none of the prior art references cited by the Office in rejecting the present claims disclose an adsorbent material which has voids on a molecular level, the prior art references, alone or combined, cannot anticipate or render obvious the presently claimed invention.

The Drawings have been amended for clarity and to conform to MPEP §608.02. Figures 1-5, 9, and 13-14 have been amended by changing the original cross-hatching on the adsorbent support (see ref no. 23). Figures 11 and 15 have not been changed because the adsorbent support (ref. no 19), identified as the basis for the objection to the Drawings, is not

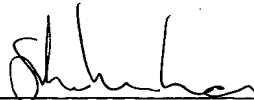
shown with an elastic body (ref. no 23) in Figures 11 and 15. Instead, Figures 11 and 15 show the adsorbent support in an embodiment as a brush (see also the paragraph bridging pages 19 and 20 of the specification).

The voids that are recited in the claims are not shown as a feature of the Drawings because they appear on a molecular scale. Applicants submit that the depiction of the molecular structure of the adsorbent material in some of the Figures is not necessary. For example and by way of an analogy only, if an article depicted in a Drawing is identified as being made of plastic it may be identified as such by a description in the specification and, if appropriate, cross-hatchings in the Drawing. If the plastic material is polyethylene it may be identified as such in the specification. If the plastic is branched polyethylene it may be identified as such in the specification. However, it is not necessary that the branching (i.e., the molecular structure of the plastic) be shown in the Drawings. For the same reason Applicants have not shown the voids in Figures 1-5, 9-16 or 22-27. Instead the voids are shown in Figures 6-8 where the molecular structure of the absorptive material is shown.

Applicants submitted an Information Disclosure Statement on June 16, 2004 providing a List of Related Cases. Applicants respectfully request the Examiner acknowledge consideration of the List of Related Cases in the examination of the above-identified application.

Respectfully submitted,

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